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Intracytoplasmic glutathione level in MII oocyte during in vitro maturation of germinal vesicle: Effect of cysteamine

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Abstract:

In the present study the kinetics of glutathione (GSH) concentration during in vitro maturation in the presence of Cysteamine in culture medium was examined. Also the effects of different doses of Cysteamine on Germinal Vesicle Breakdown (GVBD) and MetaphaseII (MII) development were investigated. Germinal vesicle (GV) oocytes was obtained from ICR mouse and cultured in Tissue culture medium (TCM199) supplemented with 0, 50, 100, 200 and 500 μ M cysteamine. Number of GVBD and MII oocytes were recorded at 4 and 24 hours after culture respectively. For GSH assay 5, 5'-dithio-bis (2-nitrobenzoic acid)-glutathione disulfide (DTNB-GSSG) reductase recycling assay was employed. Our results showed that 100 μ M cysteamine can improve GVBD and MII development significantly higher than control group ($P < 0.05$). Also all Cysteamine groups increased GVBD and MII development compared to control group except 500 μ M cysteamine groups. Developmental competence in 500 μ M group was significantly lower than control group ($P < 0.05$). In vivo GSH assay indicated that glutathione concentration in MII oocyte is significantly higher than GV stage and in vitro maturation MII oocytes. Also our results showed that 100 μ M cysteamine in culture medium increased GSH level in MII oocyte significantly compared to control ($P < 0.05$). GSH level in 500 μ M cysteamine was lower than control group but it was not significant. Presence of cysteamine in culture medium affects oocyte development competence in vitro dose dependently. Cysteamine as a thiole is able to improve development of GVBD and MII via synthesis of glutathione as a major antioxidant in the mammalian cells.

Keywords:

Germinal Vesicle

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